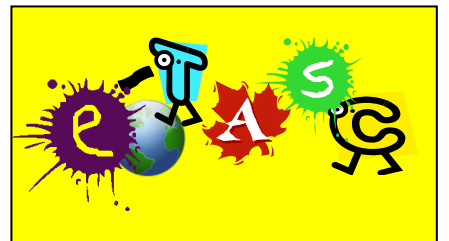


Rivers

'The blood vessels of our world'



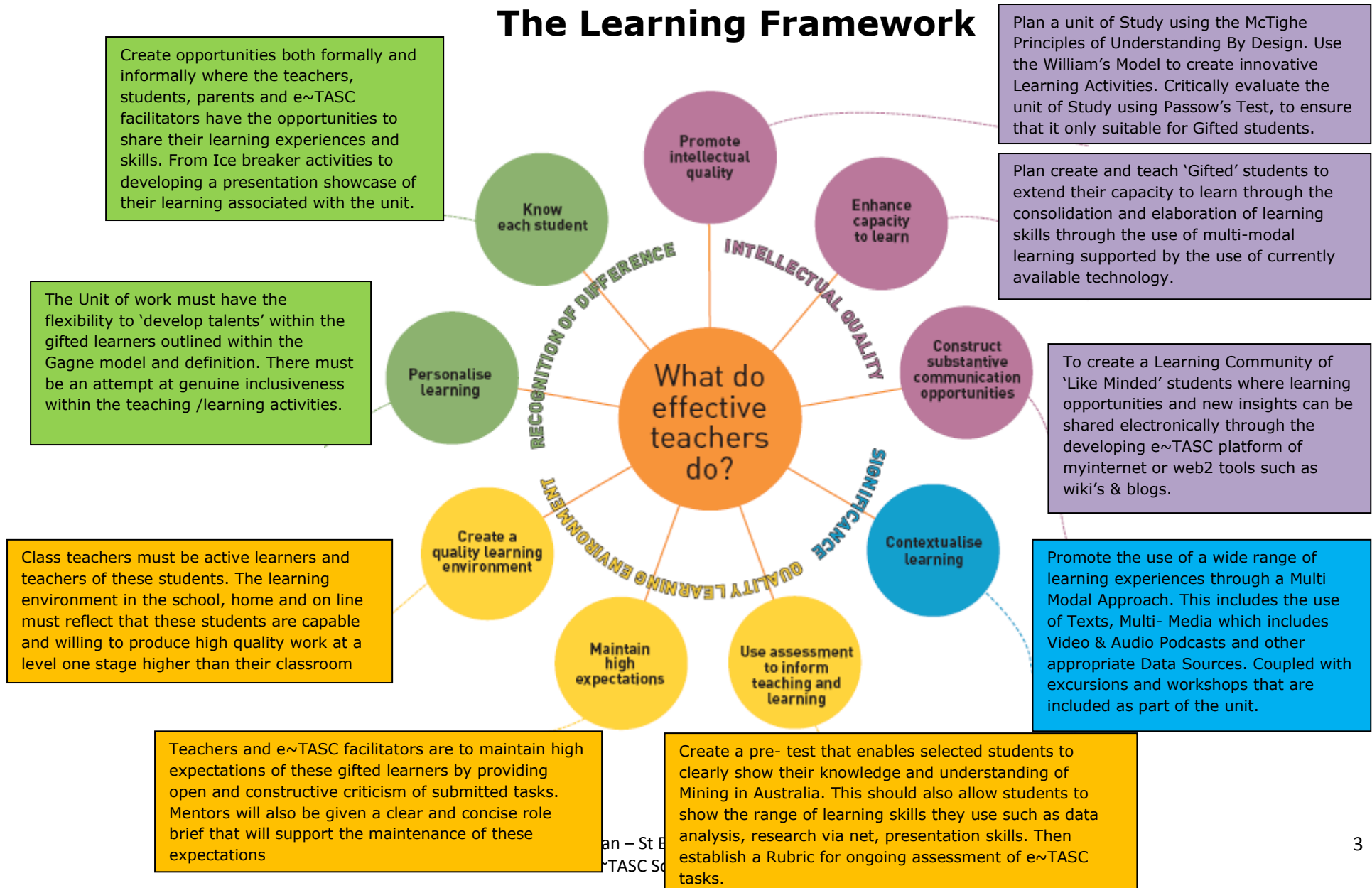
Vanessa Ryan – St Brendan's, Bankstown Central
eTASC Southern Region CEO



Frame work

- Learning Framework
- Passow's Test
- Foundation Statements (Stage 2 and 3)
- Outcomes
- Background
- UBD ~ Understanding By Design McTighe
- Williams Model
- The unit of Work
- Resources

The Learning Framework



Passow's Test

This unit of work has been devised for use with identified 'Gifted Learners' in primary schools. Therefore it is very important to understand that the teaching and learning activities are projected to students working at 2 years above their peers. For example a student selected for this unit would currently be in Year 3 or 4 Classroom of mixed ability or a gifted class. **The Outcomes and Assessments are therefore taken from Stage 3 of the NSW BOS** this allows for a number of possibilities; If students fulfil the unit work they could be given an 'A' scale grading as they are being assessed beyond their stage.

This e~TASC unit should be seen as 'Differentiation' **NOT as an extra.** It should replace some of the KLA's as many of the teaching learning activities incorporate the students being immersed in integrated activities. That is it can incorporate, English, Science, Maths, Music, Economics, HSIE or parts thereof.

Students selected to take part in this e~TASC unit should have been identified using at least two of the identification tools as outlined within the **Gifted and Talented CEO K-12 Position Paper.**

Further to this the unit of work has been assessed and developed keeping very much in mind the following statement taken from **(Gross, 2001 p26)**

- **Would** all students want to be involved in such learning experiences?
- **Could** all students participate in such learning experiences?
- **Should** all children be expected to succeed in such learning experiences?

That is to say this unit of work is really only suitable for teaching to 'Gifted' students.

Foundation Statements Stage 2

English

Students use accurate sentence structure, grammatical features and punctuation conventions to produce various texts. Students use joined letters when writing in NSW Foundation Style and develop basic desktop publishing skills.

Mathematics

Students ask questions and use appropriate mental or written strategies, and technology, to solve problems. They use appropriate terminology to describe and link mathematical ideas, check statements for accuracy and explain reasoning.

Science and Technology

Students independently implement aspects of a scientific investigation, such as observing, questioning, predicting, testing, recording accurate results, analysing data and drawing conclusions. They demonstrate an understanding of a fair test and identify variables. Students select and safely use equipment, computer-based technology and other resources throughout the processes of investigation. Students identify and describe structures and functions in living things and how they interact with each other and their environment.

Human Society and Its Environment

Students identify, locate and describe natural features in the local area and in other parts of Australia and explain their significance and management. They locate the four compass points and other significant features on a map and develop skills to locate and evaluate information from a variety of sources.

Foundation Statements Stage 3

English

They use a fluent and legible style to write and employ computer technology to present written texts effectively in a variety of ways for different purposes and audiences. Students evaluate the effectiveness of their writing by focusing on grammatical features and the conventions of writing.

Mathematics

Students ask questions and undertake investigations, selecting appropriate technological applications and problem-solving strategies. They use mathematical terminology and some conventions and they give valid reasons when comparing and selecting from possible solutions, making connections with existing knowledge and understanding.

Science and Technology

Students explore how natural forces and human interaction cause changes to the Earth over time. They recognise that the Earth is the source of most materials, and resources must be managed for sustainability. They identify trends in data, evaluate findings and prepare possible explanations. Students use, select and evaluate equipment, computer-based technology and other resources to meet the requirements and constraints of investigations.

Human Society and Its Environment

Students analyse Australian and global environments, identifying environmental issues and problems and they explore ways in which individuals and groups can contribute to solutions for these. They investigate human interactions with environments and recognise ecologically sustainable development. Students recognise various beliefs and practices and explain how these influence interactions with environments.

Outcomes

English Stage 3:

A student;

TS3.1

Communicates effectively for a range of purposes and with a variety of audiences to express well-developed, well-organised ideas dealing with more challenging topics.

RS3.5

Reads independently an extensive range of texts with increasing content demands and responds to themes and issues.

WS3.12

Produces texts in a fluent and legible style and uses computer technology to present these effectively in a variety of ways.

WS3.13

Critically analyses own texts in terms of how well they have been written, how effectively they present the subject matter and how they influence the reader.

WS3.14

Critically evaluates how own texts have been structured to achieve their purpose and discusses ways of using related grammatical features and conventions of written language to shape readers' and viewers' understanding of texts.

Mathematics Stage 3: Working Mathematically

Questioning

Students ask questions in relation to mathematical situations and their mathematical experiences

WMS3.1

Asks questions that could be explored using mathematics in relation to Stage 3 content.

Applying Strategies

Students develop, select and use a range of strategies, including the selection and use of appropriate technology, to explore and develop solutions in solving problems

WMS3.2

Selects and applies appropriate problem-solving strategies, including technological applications, in undertaking investigations.

Communicating

Students develop and use appropriate language and representations to formulate and express mathematical ideas

WMS3.3

Describes and represents a mathematical situation in a variety of ways using mathematical terminology and some conventions.

Reasoning

Students develop and use processes for exploring relationships, checking solutions and giving reasons to support their conclusions

WMS3.4

Gives a valid reason for supporting one possible solution over another.

Reflecting

Students reflect on their experiences and critical understanding to make connections with, and generalisations about, existing knowledge and understanding

WMS3.5

Links mathematical ideas and makes connections with, and generalisations about, existing knowledge and understanding in relation to Stage 3 content.

Science and Technology Stage 3:

A student;

ESS3.6

Recognises that the earth is the source of most materials and resources, and describes phenomena and processes, both natural and human, that form and change the earth over time.

INVS3.7

Conducts their own investigations and makes judgments based on the results of observing, questioning, planning, predicting, testing, collecting, recording and analysing data, and drawing conclusions.

DMS3.8

Develops and resolves a design task by planning, implementing managing and evaluating design processes.

UTS3.9

Evaluates, selects and uses a range of equipment, computer-based technology, materials and other resources to meet the requirements and constraints of investigation and design tasks.

Human Society and Its Environment Stage 3:

A student;

ENS3.5

Demonstrates an understanding of the interconnectedness between Australia and global environments and how individuals and groups can act in an ecologically responsible manner.

ENS3.6

Explains how various beliefs and practices influence the ways in which people interact with, change and value their environment.

RIVERS

Challenge Day

Glossary

Students will be required to complete an online glossary on the technical terms within this unit. A template is supplied at the end of this unit.

Mentor

Resource Book

Buddies

Each student will be paired with a buddy from another school during the launch. Please ensure that they remain in contact with each other throughout the unit. This can be done on their wiki page.

Additional information

All work is to be uploaded on to the student's wiki page for other schools to view.

RIVERS

Rivers are fresh flowing bodies of water that billions of people, plants and animals depend on. However, with current practices, river systems are being spoilt, are drying up and affecting the livelihood for many that rely on this precious resource.

Exploring how the rivers are the blood vessels of the world, students will use higher order thinking skills and questioning to delve deeper into this contemporary issue.

- Students will be investigating scientifically, the effects humans have on the river systems of the world.
- Students will explore the sustainability of past uses of water systems, namely that by indigenous cultures.
- Students will gather information and evaluate current practices considering sustainability issues.
- Students will explain how individuals and groups can act in an ecologically responsible manner through appraising programs and initiatives in place that address issues of water shortages, pollution and misuse.

ENDURING UNDERSTANDING

Rivers are the blood vessels of our world.

ENDURING KNOWLEDGE

1. Rivers are the basis of human survival
2. Rivers are priceless commodities
3. Rivers link growth and development
4. Rivers allow for exploration

KEY FOCUS QUESTION

How are rivers the blood vessels of our world?

RIVERS

The following lessons can be completed in any order. There is a time frame but you may find your group can take more or less than the allocated time. Make sure your class constantly uploads thoughts and any useful research onto the e~TASC group wiki page so we can all learn from each other.

Lesson 1 & 2

Pre-assessment and organised random search:

It takes 25 litres of water to produce a litre of beer, 1900 litres of water to grow 1 kilogram of rice and 3500 litres of water to produce 1 kilogram of grain fed chicken. We use water for just about everything – from drinking and watching, to growing food, manufacturing and cleaning up after ourselves. Fresh water is a scarce resource that influences human settlement patterns and land use. It is getting scarcer and Australia is presently in the middle of a tug of war with nature over how much fresh water can be used. Nature will win, and Australians must learn to treat water like the precious resource that it is (Sandra McEwen, Ecologic, creating a sustainable future, 2004, Powerhouse publishing, Sydney, pp54)

Using a map of the world, list and label all the rivers you know of. Using weblinks provided check if you are correct and explore other rivers that exist around the world. Using the river organizer, discover where the river flows (source and exit point), who benefits from the flow and how humans are changing the flow of this river. Once information has been gathered sort the rivers into the enduring knowledge table for future reference. (Refer to Appendix)

Teacher Evaluation

- What information did you gain from the pre-test?
- How did the group dynamics work?
- What strategies were used by students to complete the task?
- Did all students participate?

Please remember to upload your work on your wiki page for other schools to read.

RIVERS

Lesson 3

What does the term sustainable mean? How does this relate to the river system? ***The rivers of Australia's Murray-Darling basin are like salted cups of tea.*** Explore this title through an experiment to better understand the effects salinity has on rivers and the surrounding land. Following the scientific method, students will explore this concept, analyse their findings and draw conclusions. (See appendix)

<http://www.csiro.au/files/files/p8fm.pdf>

http://www.samdbnrm.sa.gov.au/Portals/7/SAMDB_Saline_Solutions.pdf

http://stm.esc.net.au/environment_salinity.php

<http://www.qld.waterwatch.org.au/schools/pdf/18%20salinity%20effects%20on%20plant%20growth.pdf>

Please remember to upload your work on your wiki page for other schools to read.

RIVERS

Lesson 4 & 5

Rivers are the blood vessels that must be sustained if the healthy flow is to continue.

Investigate this statement referring to the previous lesson and through library research, internet research, questioning scientists and experimentation.

Identify a river that is a blood vessel of a country (may be one you have previously explored) and investigate how it is being damaged.

Teachers can use the following table as a guideline when facilitating this activity.

THEME	Sustainability
BASIC SKILLS	Making judgments, Recording & Analysing data
RESEARCH SKILLS	Analysing & Interpreting data
PRODUCTIVE SKILLS	Accuracy in Information selection, Hypothesising Originality in proposed action and guidelines whilst adapting current management plans
PRODUCT	Develop a detailed management plan so that the river continues to maintain human access to commodities, growth, development and exploration. Students need to present this to others in slide show

	format, using the management plan scaffold as a guide. See Appendix
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http://www.epa.qld.gov.au/parks_and_forests/managing_parks_and_forests/management_plans_and_strategies/ (management plan ideas)

Please remember to upload your work on your wiki page for other schools to read.

RIVERS

Lesson 6 & 7

Despite Australia experiencing one of the greatest droughts on record, we continue to misuse water in this dry continent. Collect data (peer surveys, school/home water audit, government facts and figures on water usage) in order to evaluate reasons as to why we continue to do this.

Please remember to upload your work on your wiki page for other schools to read.

RIVERS

Lesson 8

Water is vital to our health yet Sewerage systems are helpful and harmful to our environment. Discuss this paradox by exploring how a sewerage system works in Sydney. Students should use websites provided

Product: Create a system that enables the sewerage system to still be helpful, yet counteracts at least two of the harmful components of a current system.

Please remember to upload your work on your wiki page for other schools to read.

RIVERS

Lesson 9 & 10

LOCAL ACTION

Find a local waterway in your catchment area that you could monitor through

- water testing
- noting/photographing visible rubbish
- existing weeds (non-native species)
- learn about human usage and impact on the area.

<http://www.nrw.qld.gov.au/education/teachers/water/activities.html>

<http://www.environment.nsw.gov.au/stormwater/HSIEteachguide/stg2activity21.htm>

After you have compiled sufficient data through observations and local research, (internet and local council) design your own initiative for this body of water. Use the points you found whilst researching current initiatives that you believe to be more beneficial to the environment and those that need to use it. You need to devise a plan that will improve the water systems current state. If you are able to, submit this to the local council for approval. Follow the GRASPS task.

G – Real world goal.

You have been assigned by the local minister for the environment to clean up a waterway in your council area. You will need to find out how this waterway has been changed from its natural state and how you and others can improve this.

R – A meaningful role

You will need to visit the local waterway and conduct tests and observations in order to grasp more knowledge on what needs to be done.

A – Authentic or real world audience

Your new plan will be sent to the local council for approval. You will need to find out who your local member is.

S – Contextualised situation

You are to implement a new initiative (plan, idea, project) that will help to improve the waterway. This can be done through a class group routinely visiting the waterway or extended into the wider community.

P – Student generated product/performance

Your new initiative will need to be presented to an audience in the form of a fact sheet, pamphlet, spoken presentation, media use, models etc. Be creative so that your idea sells!

S – Standards

Checklist to be used by all students. When initiative is complete students can critique each others in terms of effectiveness and knowledge of current government initiatives.

CHECKLIST

- Have I backed up my ideas with current research?
- Have I conducted enough tests/observations in my local area?
- Is my plan easy for others to understand?
- Is my plan easy to implement and follow?

- Have I asked others to check over my plan for new ideas or approval?

Please remember to upload your work on your wiki page for other schools to read.

RIVERS

Lesson 11 & 12

Without the Hawkesbury parts of Sydney would have been left unexplored and indigenous populations would have been untouched for many years.

Explore this statement.

- Discover which towns were settled upon through river travel (dates, maps etc)
- Learn about other modes of transportation in early Australian settlement
- Find accounts of Aboriginal encounters.

Alternatively, you can choose another major river system in the world where exploration was made possible and the indigenous population disturbed.

Students are encouraged to prove or disprove the statement by finding evidence to support their stance. Students are encouraged to take part in an online debate with other students, citing evidence and constructing well thought out arguments.

http://www.hawkesbury.net.au/memorial/wisemans_ferry_convicts/wfcm7.html

<http://www.elanorahts-p.schools.nsw.edu.au/zipweb/hawkes.html>

<http://www.hornsby.nsw.gov.au/hornsbyshire/index.cfm?NavigationID=366>

<http://www.vnc.qld.edu.au/enviro/flinders/f-p-smr-q.htm> (could be used as a webquest)

Please remember to upload your work on your wiki page for other schools to read.

RIVERS

Lesson 13 & 14

AUSTRALIAN/GLOBAL CASE STUDY

Rivers are the blood vessels of our world. Examine different initiatives set up in Australia that intend to ensure that the water continues to pump through these vital vessels. HOW do these initiatives ensure a brighter future for our river systems?

http://www.savethemurray.com/environment_murray-darling_basin_initiative.php

<http://www.mdba.gov.au/files/water-future.pdf>

<http://www.mdba.gov.au/files/restoring-balance.pdf>

http://www.mdba.gov.au/basin_plan

<http://www.mdba.gov.au/water>

<http://www.environment.gov.au/water/environmental/groundwater/gabsi.html>

<http://www.nrm.gov.au/projects/nsw/index.html> (Great site with many current projects listed)

<http://www.environment.gov.au/water/quality/trcwqi.html>

<http://www.hcr.cma.nsw.gov.au/uhrri/index.php3>

http://www.potomaccleanup.org/trash_initiative/rc_india.html

Compare and contrast water usage between different authorities and campaign groups such as:

- Murray Darling Basin authority
- Great Artesian Basin
- Tasmanian river catchment
- Upper Hunter
- India – Potomac river

How are they similar and different? Using the information you have read, how can you account for these differences?

Create your own criteria to determine the best initiative currently being undertaken. Present your evidence in the form of a letter written to other environmental bodies, detailing the positive aspects of the chosen initiative and how they can integrate these ideas into their current practices so to see better improvement. Send letter!

<http://www.globalresponse.org/letterwritingtips.php> (letter writing tips)

Please remember to upload your work on your wiki page for other schools to read.

Resources

Useful websites

http://www.mdbc.gov.au/subs/The_River/november2008/index.html
(Murray River)

http://rivers.gov.au/Training_and_Education/index.html

<http://www.bbc.co.uk/schools/riversandcoasts/>

<http://www.bewsher.com.au/georges/about.htm> (Georges River)

<http://www.sydneywater.com.au/OurSystemsAndOperations/WastewaterTreatmentPlants/GeorgesRiverPlants.cfm> (Sydney water)

<http://www.rev.net/~aloe/river/> (rivers of the world list)

<http://www.slco.lib.ut.us/kidriver.htm> (major river systems)

<http://www.environment.nsw.gov.au/ieo/GeorgesRiver/map.htm>

<http://www.kidcyber.com.au/topics/rivers.htm> (rivers of the world)

http://www.globaleye.org.uk/primary_autumn2001/focuson/people-rivers.html (people and rivers)

<http://www.teachers.ash.org.au/jmresources/rivers/links.html> (Rivers of the world list of links)

<http://www.nativefish.asn.au/ozrivers.html> (major Australian rivers)

http://www.acfonline.org.au/articles/news.asp?news_id=408&c=12511
(Murray darling policy)

http://www.acfonline.org.au/default.asp?section_id=17 (ACF – facts and initiatives on Murray-darling)

<http://www.streamwatch.org.au/streamwatch/>

<http://www.sydneywater.com.au/SavingWater/>

<http://www.water.gov.au/>

(Water usage facts and river health)

<http://www.ozgreen.org.au/index.php>

(green initiative)

<http://www.sydneywater.com.au/EnsuringTheFuture/WaterSchool/>

(school ideas)

<http://www.sydneywater.com.au/EnsuringTheFuture/WaterSchool/EducationResources/primary.cfm> (resources and fact sheets)

http://education.melbournwater.com.au/content/rivers_and_drainage/rivers_and_drainage.asp (river facts Victoria)

<http://www.samdbnrm.sa.gov.au/BoardProjects/CatchmentCareandWaterWatch/EducationandResources/tabid/343/language/en-AU/Default.aspx>
(Excellent river resources)

http://www.abc.net.au/learn/silentflood/edu_ep3a.htm (Salinity)

<http://www.csiro.au/partnerships/SYP.html> (CSIRO)

<http://www.vic.waterwatch.org.au/inform.php?a=6&b=192&c=208>
(download resources)

http://www.landlearn.net.au/print/catchments_know_your_catchments.htm (Catchment areas in Victoria)

<http://www.environment.nsw.gov.au/stormwater/HSIEteachguide/stg2activity21.htm> (preparing own catchment map)

<http://www.science.org.au/nova/095/095act.htm> (water links)

<http://www.abc.net.au/learn/silentflood/edu.htm> (salinity)

http://www.cap.nsw.edu.au/teachers/tech_based_resources/MI_pages/MI_BT_UNITS/html/Living_with_salt.htm (salinity)

<http://www.saltwatch.org.au/saltwatch/book/index.html> (salinity experiments)

<http://www.science.org.au/nova/075/075act.htm>

http://rivers.gov.au/ramblers/activities/activity1/rivram_model0.htm (riverbank stability)

http://rivers.gov.au/ramblers/activities/activity0/rivram_absorb1.htm

(Water absorption)

Plus, Minus and Interesting Chart

Plus	Minus	Interesting

Expert's Glossary

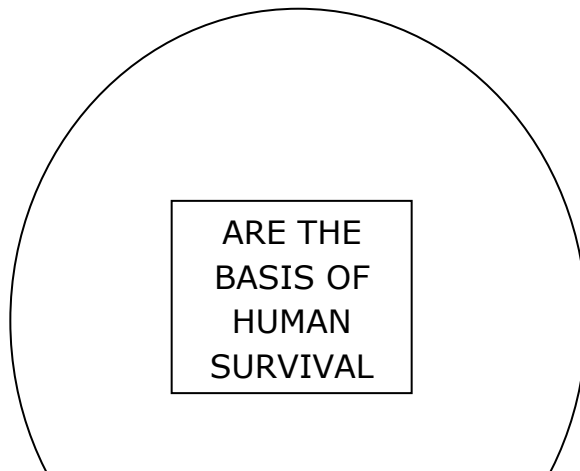
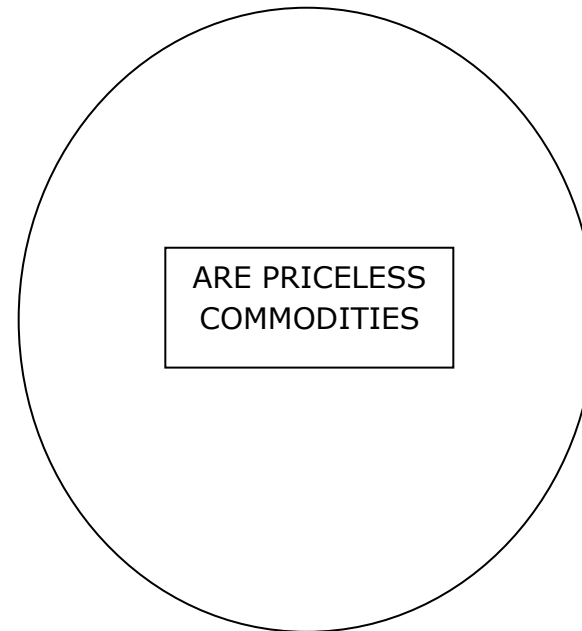
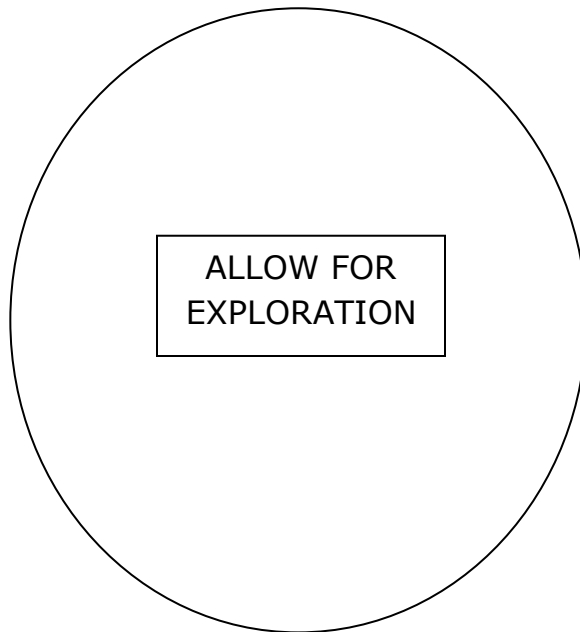
Technical Word	Meaning

Rivers of the world

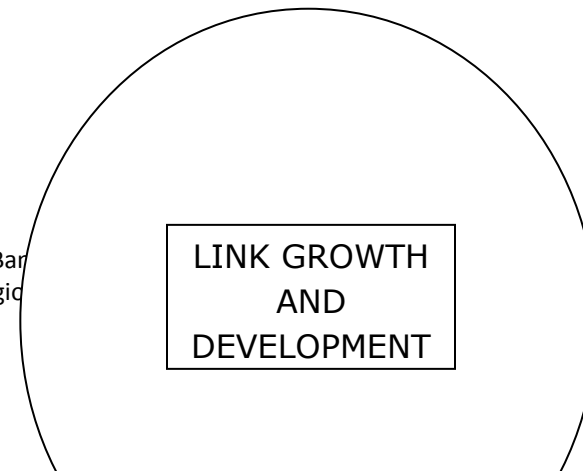
RIVER NAME	LOCATION	SOURCE	EXIT POINT	HOW IS RIVER USED CURRENTLY?	HOW DID/DOES THE INDIGENOUS POPULATION. USE THE RIVER?	HUMAN IMPACT

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USING THE INFORMATION SORTED INTO THE RIVERS OF THE WORLD ORGANISER AND FURTHER RESEARCH, DISCOVER 3 RIVERS THAT:



n – St Brendan's, Bar
TASC Southern Regio



Salinity Experiment

The rivers of Australia's Murray-Darling basin are like salted....

What is the problem?

- The rivers of the basin are becoming too salty due to a rising water table, lack of native plants with deep roots and excess water usage by farming. How does salinity effect the soil

What is the aim of your experiment?

To find out how salinity effects the soil and the plant growth

Hypothesis

Experiment description. (equipment, time frame)

Method

Results (Include observations and findings)

Analyse your results – Think about your findings. Were they valid? Reliable?

Did your experiment support your hypothesis? If not, how can you perform a new experiment?

Draw conclusions

1. Define/Identify the Problem
2. Form a Hypothesis
3. Make Observations or Test Hypothesis and Perform Experiments
4. Organize and Analyze Data
5. Do Experiments and Observations Support Hypothesis?
 - If No, Perform New Experiments and Repeat Step 4
6. Draw Conclusions
7. Communicate Results

River Maintenance Management Plan

Current situation	Desired outcome	Proposed action and guidelines